



# Roy Schepens, Manager DOE-Office of River Protection

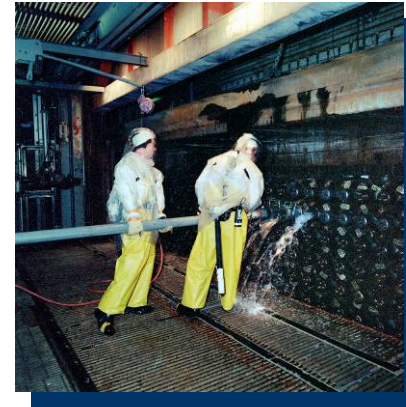
Portland, Oregon  
June 29, 2006



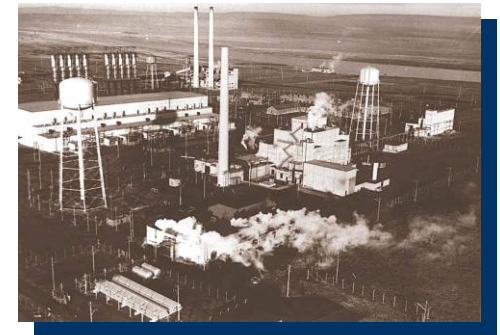


# History

- ❑ Established during World War II as part of the Manhattan Project, the site produced plutonium for nuclear weapons through the late 1980s
  - Produced ~74 tons of plutonium
  - Plutonium and uranium recovery
  - Operated 9 plutonium production reactors



*Reactor irradiation*



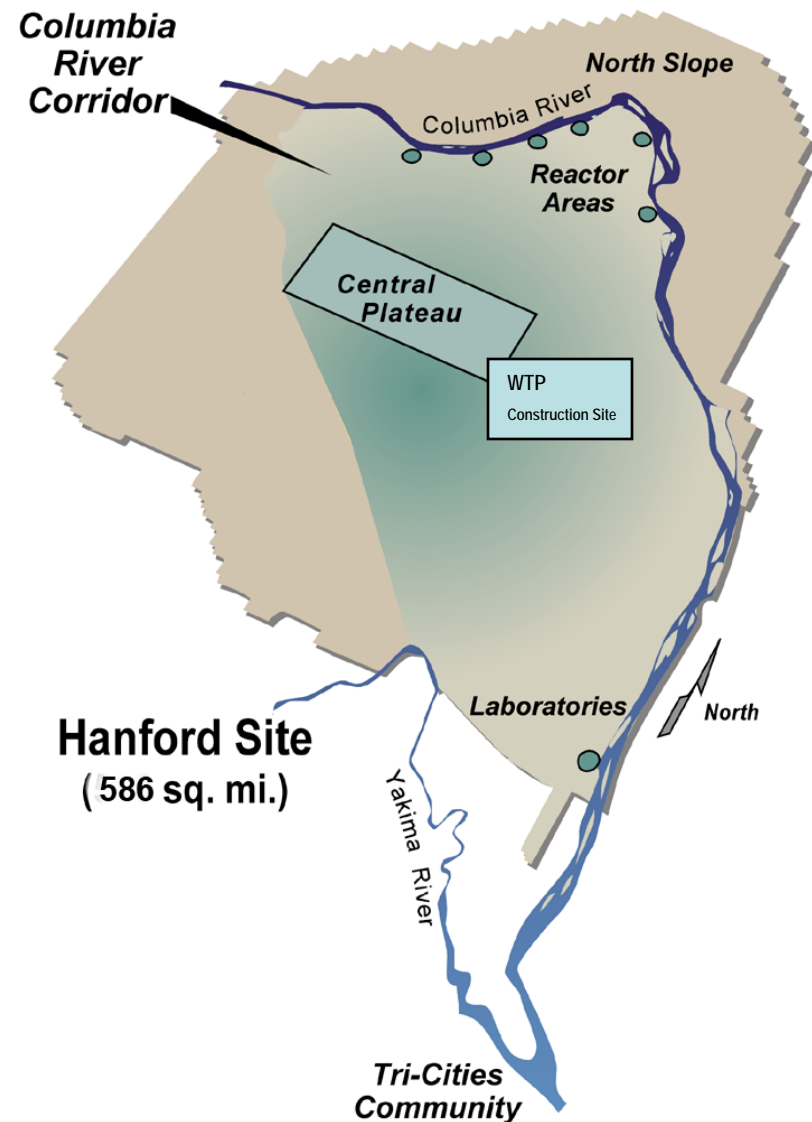
*B Reactor*





# Hanford Overview

- ❑ 586 square miles
- ❑ Adjacent to Tri-Cities community, population ~300,000
- ❑ Two Federal Offices at Hanford for Environmental Management (EM)
  - Richland Operations Office
    - River Corridor and
    - Central Plateau cleanup
  - Office of River Protection
    - Tank Farm cleanup and
    - Waste Treatment & Immobilization Plant (WTP)
- ❑ Transition to cleanup operations in 1989
- ❑ Workforce of ~7,000
- ❑ Total RL & ORP Budget for Fiscal Year (FY) 2006 is \$1.8 billion
- ❑ Pacific Northwest Site Office (non EM Mission)
  - Pacific Northwest National Laboratory
  - Hazardous Material Management and Emergency Response
  - Workforce of 4,200
  - Estimated Annual Budget of \$800 million







## Hanford Overview (continued)

### ☐ Oversight

- Washington State Department of Ecology
- U.S. Environmental Protection Agency
- Defense Nuclear Facilities Safety Board

### ☐ Tri-Party Agreement (TPA) outlines legally enforceable milestones for Hanford cleanup

### ☐ Tribal Government consultation

### ☐ Stakeholder involvement through the Oregon Hanford Cleanup Board and the Hanford Advisory Board

### ☐ Legacy contamination includes plutonium, strontium, uranium, other metals, and organic compounds



# U.S. Department of Energy

RL Funding Summary					
PBS	PBS Title	FY06 Allocation	FY07 President's Budget	Proposed FY08 Target Allocation	
RL-0011	NM Stabilization and Disposition-PFP	138,259	81,651	100,942	*
RL-0012	SNF Stabilization and Disposition	113,835	81,069	34,141	
RL-0041	Nuclear Facility D&D-River Corridor Closure Project	174,950	221,022	266,539	
RL-0043	HAMMER	7,351	**	7,912	
RL-0044	B-Reactor	970			
<b>Subtotal 2012</b>	<b>2012 Accelerated Completion</b>	<b>435,365</b>	<b>383,742</b>	<b>409,534</b>	
RL-0013	Solid Waste Stabilization and Disposition-2035	163,789	228,865	213,273	*
RL-0030	Soil and Water Remediation-Groundwater/Vadose Zone	73,014	75,973	74,969	*
RL-0040	Nuclear Facility D&D-Remainder of Hanford	69,403	94,270	90,935	*
RL-0080	Operate Waste Disposal Facility	5,745	3,534	3,294	
RL-0100	Richland Community and Regulatory Support	15,104	18,332	18,607	*
HQ-SNF-0012X	SNF Stabilization & Disp.-Storage Operations Awaiting Geologic Repository	1,777	-	-	
<b>Subtotal 2035</b>	<b>2035 Accelerated Completion</b>	<b>328,832</b>	<b>420,974</b>	<b>401,078</b>	
RL-0020	Safeguards and Security	81,463	77,836	79,645	
RL-0042	Nuclear Facility D&D-Fast Flux Test Facility Project	45,652	34,843	10,000	*
<b>Total - RL</b>	<b>Office Total</b>	<b>891,312</b>	<b>917,395</b>	<b>900,257</b>	

\* RL has submitted a FY 2008 over-target budget request in these areas.

\*\* HAMMER is funded in Closure Services (Indirect) in FY 2007



# ORP Funding Summary (Dollars in thousands)

PBS	Project #	PBS Title	FY06 Allocation (1)	FY07 President's Budget	FY08 Target
ORP-0014	N/A	Tank Farms - Operating Expense	\$ 325,721	\$ 273,656	248,205
	03-D-403	Tank Farms - Line Item Canister Storage Building	\$ -	\$ -	24,890
		Subtotal ORP-0014	\$ 325,721	\$ 273,656	273,095
ORP-0060	Multiple	Line Item Major Construction - WTP	\$ 520,759	\$ 690,000	580,325
ORP-0100	N/A	Hanford Advisory Board	\$ 466	\$ 471	471
<b>Total - RL</b>		<b>Office Total</b>	<b>\$ 846,946</b>	<b>\$ 964,127</b>	<b>\$ 853,891</b>

Note 1: The FY 2006 allocation reflects the 1 percent across-the-board recission, and includes funds held at HQ.

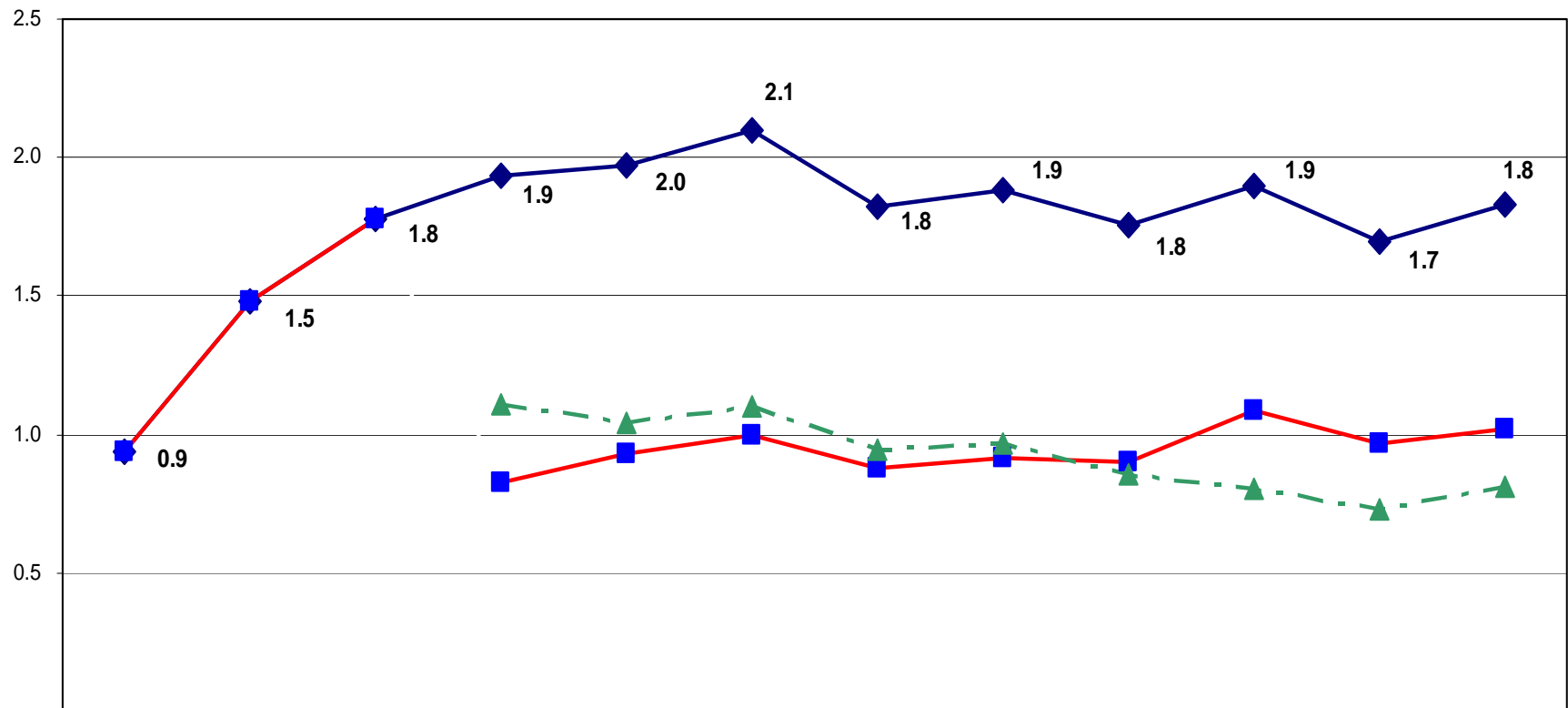
**ORP has submitted an FY 2008 Over-Target Budget Request**



# U.S. Department of Energy

## Hanford Funding History

Dollars in Billions



	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
EM	0.9	1.5	1.8	1.9	2.0	2.1	1.8	1.9	1.8	1.9	1.7	1.8
RL	0.9	1.5	1.8	0.8	0.9	1.0	0.9	0.9	0.9	1.1	1.0	1.0
ORP				1.1	1.0	1.1	0.9	1.0	0.9	0.8	0.7	0.8



## Central Plateau

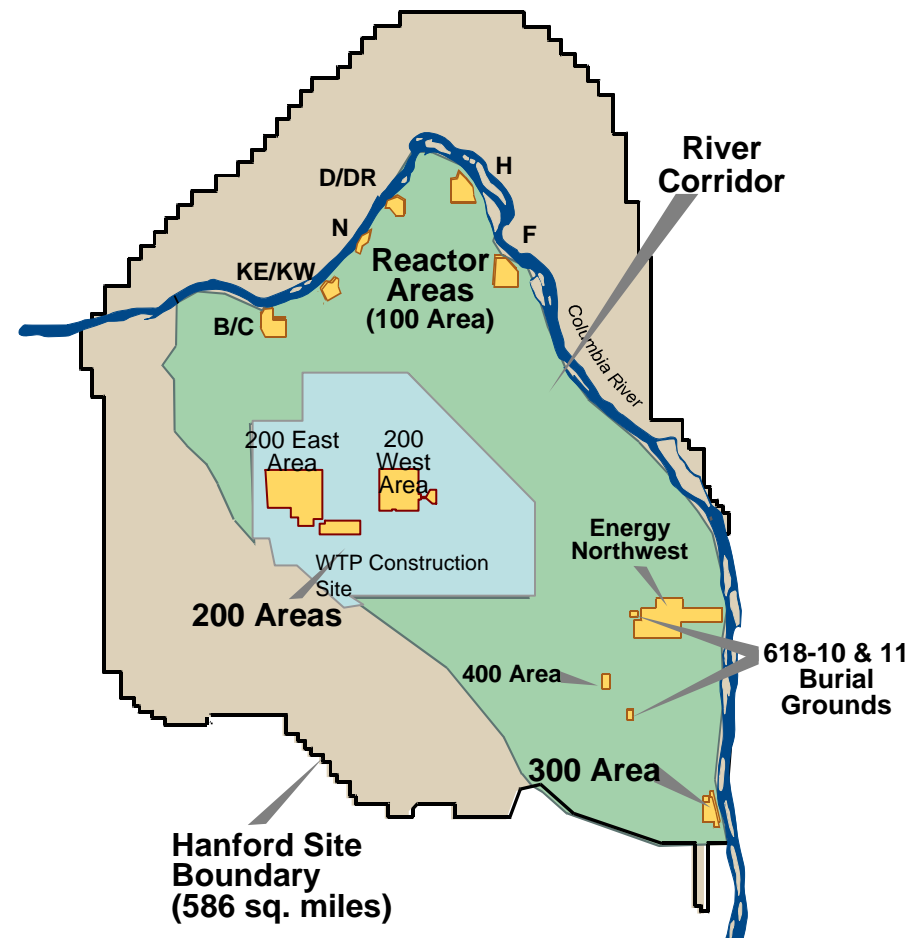
*(75 square miles)*

- ❑ Demolition of 950 structures/facilities
- ❑ Remediation and closure of 850 burial grounds and waste sites
- ❑ Remediate and clean up five large processing canyons
- ❑ Remediate and treat groundwater plumes
- ❑ 53 million gallons of tank waste remain
- ❑ 177 radioactive liquid waste tanks remain

## River Corridor

*(218 square miles)*

- ❑ Demolition of 510 facilities
- ❑ Remediation and closure of 486 waste sites and burial grounds
- ❑ Place nine reactors into safe storage condition (5 complete, 4 remaining including B Reactor, which could become a museum)
- ❑ Disposal operations: treatment, transportation, disposal (4 million tons of waste)







# Office of River Protection

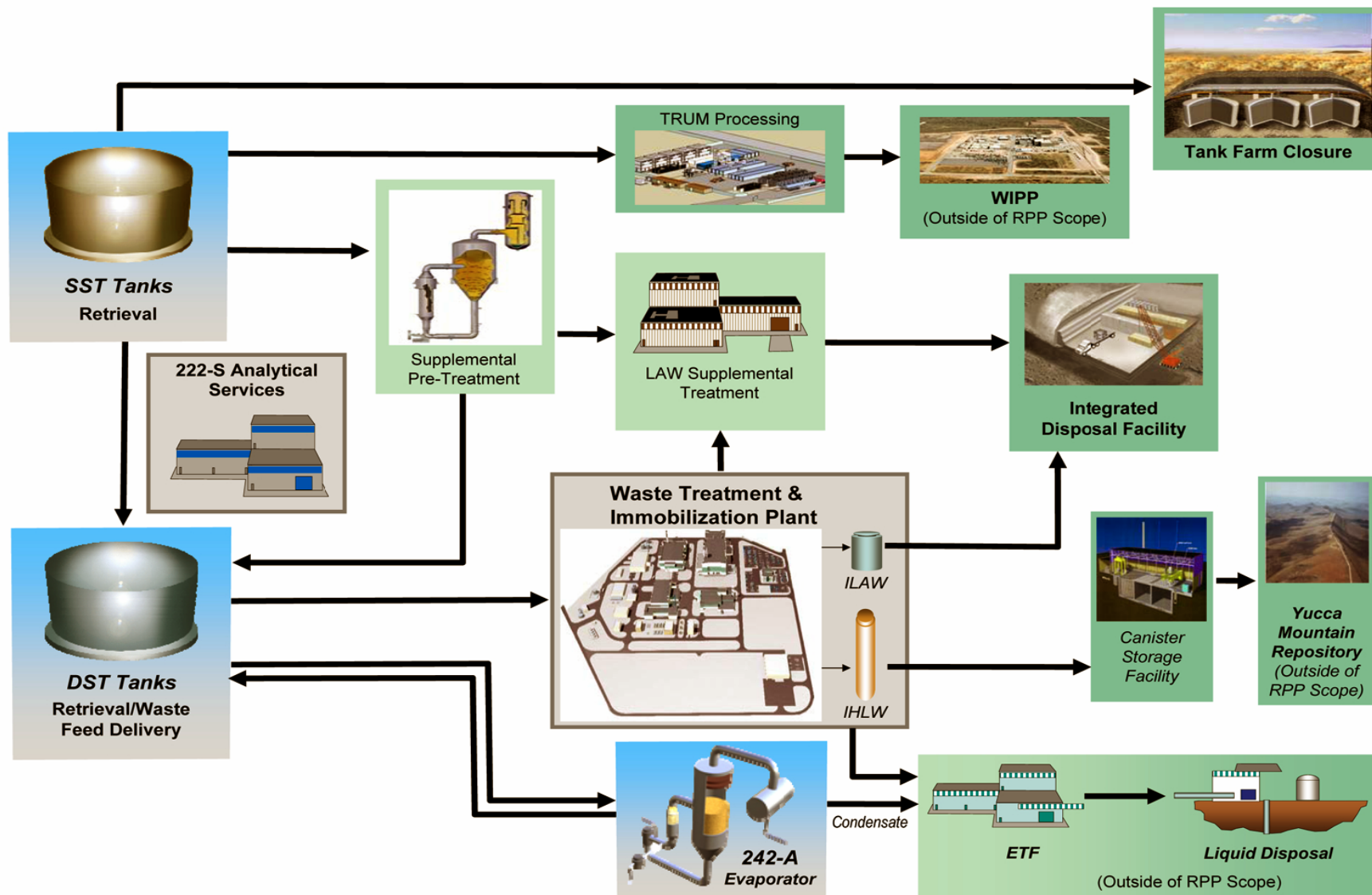
- ❑ Established by the U.S. Congress in 1988
- ❑ Exclusive focus on solving the Hanford tank cleanup challenge
- ❑ Two prime contractors
  - CH2M HILL Hanford Group, Inc.
  - Bechtel National, Inc.



# U.S. Department of Energy



## River Protection Project Mission





## Status of the River Protection Mission



### Waste Treatment Plant Construction

- Construction 30% complete
- Design 70% complete



### Tank Retrieval and Closure Activities

- Tanks retrieved to date: C-106, C-203, C-202 and C-201.
- Tanks in retrieval: S-112; S-102 and C-103
- Tank being outfitted for retrieval: C-108



### Design and Testing of Supplemental Low-Activity Waste Treatment

- Laboratory Scale Testing, >45 tests to date, one with actual waste
- Engineering Scale Testing, 16 tests to date, one with actual waste
- Large-Scale Testing, with simulant waste, 7 tests to date

### Integrated Disposal Facility

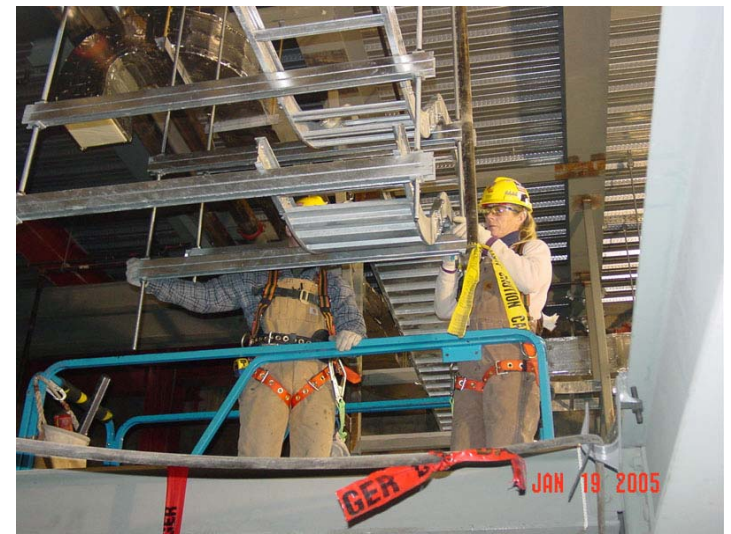
- Construction completed



# ORP Safety Culture

- ❑ Focus on continuous improvement
- ❑ Institutionalize a learning organization – Learn from mistakes
- ❑ Invest in system safety training and leadership training
- ❑ Demand a healthy pessimism – inquisitiveness
- ❑ Stick with basics – disciplined conduct of engineering and operations
- ❑ Safety programs must be visible, critical, empowered, and fully engaged
- ❑ Focus safety efforts on prevention – worst case event failure consideration

## *Protect all Workers*







# Waste Treatment Plant

- ❑ Construction 30% Complete
- ❑ Design 70% Complete
- ❑ Continue construction of Low Activity Waste Facility, Balance of Facilities, Analytical Laboratory
- ❑ Suspended construction in Pretreatment and High-Level Waste facilities to focus on incorporation of revised seismic criteria and on advancing the design
- ❑ Recent Challenges
  - Cost growth/steel, labor and escalation
  - Solving technical problems
    - Seismic
    - Hydrogen gas
    - Mixing
    - Ultra-filtration/Concentration
    - Leaching for Chrome and Aluminum







# WTP Work Continues, But Challenges Remain

## ☐ What Has Worked:

- Right-sized plant – more capable – that can complete the mission
- Building a well qualified and experienced staff

## ☐ What could have been done better:

- Earlier use of industry experts
- Engineering and construction too closely coupled
- Very large projects contingency calculation methodology underestimated impacts of Programmatic risks, world economics, under-appreciation of escalation/inflation rates, and technical risks

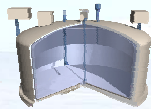
## ☐ What's Next:

- Establish credible Project cost and schedule baseline
  - Addressing recommendations from industry experts
  - U.S. Army Corps of Engineers completing validation of review of the May 2006 Project Estimate at Completion
  - Plan to have new project baseline by late summer 2006
  - Develop an Interim Project Baseline
  - Certify the contractor's Earned Value Management System in September 2006

# Hanford Tank Cleanup Status

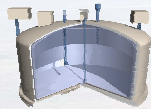
Retrieval Summary Updated through April 2006

## RETRIEVED



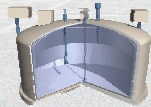
### C-201 (Just completed)

- Capacity of tank: 55,000 gallons
- Retrieval started: October 25, 2005
- Volume of waste to be removed: 861 gallons
- Curies to be removed: 1,154
- Technology used: Vacuum retrieval



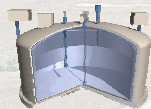
### C-202

- Capacity of tank: 55,000 gallons
- Completion date: August 11, 2005
- Volume removed: 1,183 gallons
- Curies removed: 2,560
- Technology used: Vacuum retrieval
- Lessons learned from first application reduced retrieval time from nine months to just six weeks.*



### C-203

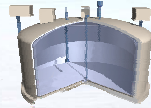
- Capacity of tank: 55,000 gallons
- Completion date: March 24, 2005
- Volume removed: 2,441 gallons
- Curies removed: 1,095
- Technology used: Vacuum Retrieval
- First application of this innovative retrieval technology*



### C-106

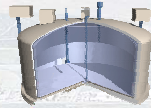
- Capacity of tank: 530,000 gallons
- Completion date: December 31, 2003
- Volume removed: 194,229 gallons
- Curies removed: 8,885,700
- Technology used: Sluicing/Acid dissolution
- C-106 was a high heat tank and was placed on a safety "watch list." Retrieval of the waste solved this safety issue.*

## IN PROGRESS



### C-103

- Capacity of tank: 530,000 gallons
- Retrieval started: November 6, 2005
- Volume of waste to be removed: 72,000 gallons
- Volume of waste removed to date: 45,231 gallons
- Volume of waste remaining in tank: 26,769 gallons
- Curies removed to date: 2,089,868 of 3,042,606
- Technology in use: Modified sluicing



### S-102

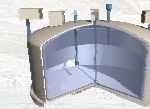
- Capacity of tank: 758,000 gallons
- Retrieval started: December 17, 2004
- Volume of waste to be removed: 464,000 gallons
- Volume removed to date: 253,000 gallons
- Volume of waste remaining in tank: 211,000 gallons
- Curies removed to date: 335,199 of 704,283
- Technology in use: Saltcake Dissolution
- Engineers developed unique variable height pump to prevent clogging that occurred using conventional pump assembly.*



### S-112

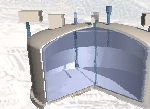
- Capacity of tank: 758,000 gallons
- Retrieval started: September 28, 2003
- Volume of waste to be removed: 614,000 gallons
- Volume removed to date: 608,000 gallons
- Volume of waste remaining in tank: 6,000 gallons
- Curies removed to date: 576,962 of 628,068
- Technology in use: Remote Water Lance/Modified Sluicing
- Demonstrate project under way to determine effectiveness of remote water lance to break up and mobilize hardened waste at bottom of tank.*

## NEXT IN LINE



### C-204

- Capacity of tank: 55,000 gallons
- Volume of waste to be removed: 1,500 gallons
- Curies to be removed: 540
- When retrieval to begin: June 1, 2006
- Technology to be used: Vacuum retrieval



### C-108

- Capacity of tank: 530,000 gallons
- Volume of waste to be removed: 66,000 gallons
- Curies to be removed: 160,000
- When retrieval to begin: FY 2007
- Technology to be used: Modified sluicing

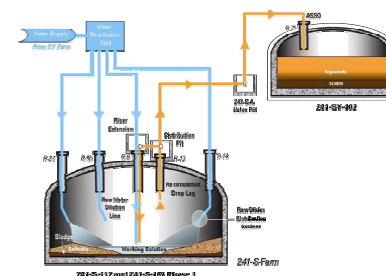
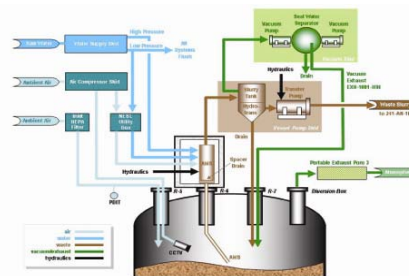
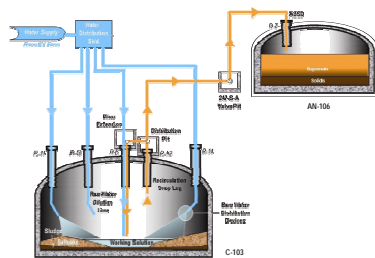
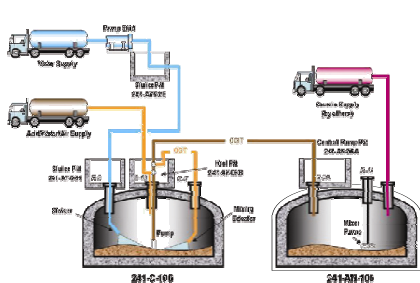
● Acid Dissolution

● Modified Sluicing

● Vacuum Retrieval

● Saltcake Dissolution

Remote Water Lance (Salt Mantis)





# Hanford Tank Farm Project

- ❑ Retrieval of waste from older single-shell tanks continues
- ❑ Technologies based on waste characteristics and tank physical condition
- ❑ Demonstrating achievability of 99% waste retrieval
- ❑ Working with State of Washington and Nuclear Regulatory Commission on retrieval effectiveness
- ❑ Managing available Double-Shell tank space







# Summary

- ❑ Focus on activities that reduce risk
  - Remove/stabilize high-risk materials
  - Deactivate and decommission excess facilities
  - Minimize long-term risks related to materials that will remain on-site
  - Work closely with regulators and the community to make decisions to guide and enable physical progress
  - Deploy comprehensive business approaches to improve performance
- ❑ Working safely
- ❑ Contract Acquisitions
- ❑ Workforce transitions
- ❑ Partnership – DOE, regulators, contractors, workforce, stakeholders and the community

